

Case No. UC0362USNA
Application No. 10/802,704

Applicants' Remarks

Status of Claims

Claims 1, 2, 4-8, and 29-33 are pending. Claims 9-28, previously withdrawn, are canceled. Claims 1 and 31-33 are amended.

Claim 1 is amended to indicate that the polythiophene has Formula I(a) and to delete Formula I(b).

Claims 31-33, previously numbered as 32-34, are amended to provide proper sequential numbering.

Claim 33 is also amended to delete the $-\text{CH}_3$ and $-\text{CH}_2\text{CH}_3$ groups as possibilities for X, and to recite appropriate Markush language.

No new matter is introduced by these amendments.

Claim Numbering

The numbering of claims originally submitted as Claims 32-34 has been changed to Claims 31-33. Applicants thank the Examiner for pointing out the inadvertent error in numbering.

Claim Rejections – 35 USC § 112

Claim 33 stands as rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement. Applicants respectfully submit that this rejection has been overcome by the amendments to Claim 33 and request that this rejection be withdrawn.

Claim Rejections – 35 USC § 102 and § 103

[1] Pickup et al., J. New Mat. Electrochem. Systems, 3, 21-26 (2000) ("Pickup").

Claims 1, 2, 4-8 and 29-33 stand as rejected under 35 U.S.C. § 102(b) as anticipated by, or in the alternative, under 35 U.S.C. § 103 (a) as unpatentable over Pickup.

Applicants' invention is an aqueous dispersion of at least one polythiophene having Formula I(a) and at least one colloid-forming fluorinated polymeric sulfonic acid. The meaning of "aqueous dispersion" is given at page 6, lines 32-34:

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As used herein, the term "dispersion" refers to a continuous liquid medium containing a suspension of minute particles.

The "continuous medium" comprises an aqueous liquid.

This is distinctly different from the composite materials disclosed by Pickup. Pickup describes the "PEDOT/Nafion" composite as a powder (abstract, and page 23 § 3.1, first paragraph) or "gel-like with no discrete particles" (page 23, § 3.1, second paragraph). Clearly a powder is not the same as an aqueous dispersion. Applicants respectfully submit that a gel is also not the same as an aqueous dispersion. A gel is a colloid in which the disperse phase has combined with the continuous phase to produce a semisolid material, as a jelly (reference attached). A semisolid jelly is not the same as an aqueous dispersion. Furthermore, it is not at all evident that such gel-like material is capable of forming a film.

The Office Action states, on page 4, that "Pickup's description of 'no discrete particles' clearly implies submicron particles dispersed in the liquid medium." Applicants respectfully submit that "no discrete particles" means, literally, no discrete particles. Applicants can find no implication of any particles at all, of any size. Applicants further submit that something which is "gel-like" has no liquid medium as the term applies to the claimed subject matter. Applicants can find no teaching or suggestion in Pickup of an aqueous dispersion as recited in Claim 1, or any of the claims dependent thereon. In fact, the word "dispersion" cannot be found in the Pickup article.

In light of the above arguments, Applicants respectfully submit that this rejection has been overcome and request that it be withdrawn.

[2] Sotzing, U.S. Application 2004/0010115 ("Sotzing")

Claims 1, 2, 4-8 and 29-33 stand as rejected under 35 U.S.C. § 102(b) as anticipated by Sotzing.

Sotzing discloses polymers of thieno[3,4-b]thiophene. Copolymers with thiophene and substituted thiophenes are also disclosed. By contrast, Applicants' invention as recited in amended Claim 1, relates to a polymer having Formula I(a). As currently amended, Claim 1 is not anticipated by Sotzing.

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In light of the above amendments and arguments, Applicants respectfully submit that this rejection has been overcome and request that it be withdrawn.

[3] Ohtani et al., U.S. Patent 4,869,979 ("Ohtani")

Claims 1, 2, 4-8 and 29-33 stand as rejected under 35 U.S.C. § 103(a) as obvious over Ohtani.

Ohtani discloses a conducting polymer for use in batteries. Polythiophene is listed as a possible conducting polymer and "Nafion" is listed as one of many possible polymer anions. However, there is no teaching in Ohtani of a method of making a stable aqueous dispersion of polythiophene/"Nafion" and no suggestion of making a stable aqueous dispersion of the polythiophene having Formula I(a). Ohtani states at column 3, lines 37-48, that the subject conducting polymer can be formed as described in *Chem. Lett.*, Vol. 1986, 687, and JP-A-59-98165 (equivalent to Cross et al., U.S. Patent 5,378,402). The *Chem. Lett.* article describes only electropolymerization to form the polymer on a substrate. Cross et al. describe electropolymerization and chemical polymerization, but the only oxidant suggested is ferric iron. Ferric iron will cause gelation of colloidal acids such as Nafion® - as is the case in Pickup (see Table 2, Fe^{3+} to Monomer Ratio). There are no examples in Ohtani of polythiophene. In the examples that are present, precipitates are formed, not stable aqueous dispersions. Neither Ohtani nor the references cited therein, teach or fairly suggest Applicants' stable aqueous dispersion of polythiophene having Formula I(a) and a colloid-forming polymeric acid, as recited in Claim 1. Nor are any of the claims dependent on Claim 1 fairly taught or suggested.

In light of the above arguments, Applicants respectfully submit that this rejection has been overcome and request that it be withdrawn.

[4] Hsu et al., published U.S. Application 2005/0102577 ("Hsu")

Claims 1, 2, 4-8 and 29-33 stand as rejected under 35 U.S.C. § 102(b) as anticipated by Hsu.

Applicants respectfully submit that the amendment to Claim 1 has overcome this rejection. Hsu does not disclose a composition with a polythiophene having Formula I(a).

Applicants respectfully request that this rejection be withdrawn.

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Conclusion

For all of the foregoing reasons, Applicants respectfully submit that the rejections have been rendered moot or overcome by the foregoing amendments and remarks, and that the pending claims are in condition for allowance. A notice of allowance is earnestly solicited.

Should the Examiner have questions about the content of this paper or the status of the application, the Examiner is invited to call Applicants' counsel at the telephone number listed below.

Respectfully submitted,



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